

## LIST OF THE SIPHONAPTERA OF CALIFORNIA.

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The wealth of fauna displayed in the list of mammals from California makes one wonder at the paucity of Siphonaptera recorded from the Golden State. The comparative ease with which specimens can be obtained, and the economic bearing of these parasites in the dissemination of epizootics of obscure origin, furnish an ample incentive for the collection and study of these insects. We are, nevertheless, aware of the repugnance assumed by certain entomologists toward the degenerate flea, and the dispute in which Siphonapterologists are likely to be esteemed. This contempt, we observe, is not the brand which is bred through familiarity. We venture to surmise, a familiarity with the flea and its behaviour would indeed win many students for research in the Siphonaptera.

We may be presumptuous enough to maintain, that of all insects in California, the flea is probably the most popular ; that is to say, it is "the most sought after." Then, too, the hunting season for the flea appears to be open throughout the year, though at some periods it proves a greater "craze" than at others. The present gigantic endeavours of the Surgeons of the U. S. Public Health and Marine Hospital Service in their efficient measures for the suppression of plague in California, are stirring up a popular interest in the flea and its notorious associations. One of the Surgeons in this Service, Dr. Carroll Fox, during the few months engaged in this work has contributed to the California Siphonaptera a greater number of species than any other entomologist.

The bibliographical references pertain only to the records of California workers.

Prior to 1905 the Siphonaptera recorded from California consisted of the following species :

- Anomiopsyllus Californicus, Baker.
- Ceratophyllus acutus, Baker.
- C. proximus, Baker.
- C. sexdentatus, Baker.
- C. Californicus, Baker.
- C. ciliatus, Baker.

The first of these was described in 1904, Invert. Pacif., I, p. 39. The remainder were recorded from California in 1904, Proc. U. S. N. M., XXVII.

In 1907 this list was supplemented by the following species taken from rats:

- Pulex irritans*, Linn.  
*Loemopsylla (Pulex) cheopis*, Roth.  
*Ctenocephalus canis* (Curt), Baker.  
*Ceratophyllus fasciatus*, Bosc.  
*Ctenopsyllus musculi* (Duges), Wagner.

These were first recorded as rat fleas in Bull. Cal. State Board of Health, 1907, III, No. 5, p. 39.

The list was augmented in 1908 by the species following:

- Argopsylla gallinacea* (Westwood), Enderlein.  
*Hoplopsyllus anomalus*, Baker.  
*Ceratophyllus ignotus*, Baker.

These three species were recorded in Entomological News, October, 1908, pp. 380-382.

The remaining species, with a few exceptions, were embodied in a report on the Species of the Siphonaptera found within the boundaries of the city and county of San Francisco, by Fox, Jan., 1909, Entomological News, pp. 10-11.

The following compilation constitutes a compendium of the species of fleas, with normal and occasional or accidental hosts. It may be of interest to note that the fleas recorded from rats had been identified after an examination of more than 200,000 rats of the common varieties found locally and taken from ships in the San Francisco harbour. The squirrel fleas were collected from several hundred California ground squirrels. Two species, *Ceratophyllus acutus* and *Hoplopsyllus anomalus*, seem fairly constant in the San Francisco Bay region and in the vicinity of Los Angeles.

Family RHYNCHOPRIONIDÆ, Baker.

Genus *Argopsylla*, Enderlein.

1.—*Argopsylla gallinacea* (Westwood), Enderlein.

1908.—Mitzmain, Entomological News, XIX, No. 8, p. 381.

Hosts.—Poultry and farm animals, occasionally man.

Region.—Central California.

## Family PULICIDÆ.

Subfamily Anomiopsyllinæ, Baker.

Genus Anomiopsyllus, Baker.

2.—*Anomiopsyllus Californicus*, Baker.

1904.—Baker, Invert. Pacifica, I, p. 39.

Hosts.—Western spotted skunk (*Spilogale phenax*).

Region.—Southern California.

## Subfamily Pulicinæ.

Genus *Pulex*, Linnæus.3.—*Pulex irritans*, Linn.

1907.—Mitzmain, Bull. Cal. State Board of Health, III, No. 5, p. 39.

Hosts.—Man; domestic fowl, *Gallus domesticus*; brown rat, *Mus Norvegicus*; black rat, *Mus rattus*; dog, *Canis familiaris*; California skunk, *Mephitis occidentalis*.

Region.—Throughout California.

Genus *Lœmopsylla*, Rothschild.4.—*Lœmopsylla (Pulex) cheopis*, Roth.

1907.—P. pallidus, Tasch.; Mitzmain, Bull. Cal. State Board of Health, III, No. 5, p. 39.

1908.—Cheopis, Mitzmain, Entomological News, XIX, No. 8, p. 381.

Hosts.—House mouse, *Mus musculus*; brown rat, *Mus Norvegicus*; black rat, *Mus rattus*.

Region.—San Francisco Bay region.

Genus *Ctenocephalus*, Kolenati.5.—*Ctenocephalus canis* (Curtis), Baker.

1907.—Mitzmain, Bull. Cal. State Board of Health, III, p. 39.

Hosts.—Dog, *Canis familiaris*; man; brown rat, *Mus Norvegicus*; black rat, *Mus rattus*.

Region.—San Francisco Bay region.

6.—*Ctenocephalus felis*, Bouché.

1909.—Fox, Entomological News, XX, p. 11.

Hosts.—Cat, *Felis domestica*; man; brown rat, *Mus Norvegicus*; California skunk, *Mephitis occidentalis*.

Region.—San Francisco Bay region.

Genus *Hoplopsyllus*, Baker.7.—*Hoplopsyllus anomalous*, Baker.

1908.—Mitzmain, Entom. News, XIX, p. 381.

Hosts.—California ground squirrel, *Citellus Beecheyi*; brown rat, *Mus Norvegicus*.

Regions.—Los Angeles and San Francisco Bay region.

8.—*Hoplopsyllus affinis*, Baker..

1909.—Fox. Not published heretofore. To appear in Entomological News.

Host.—Bachman brush hare, *Lepus Bachmani*.

Region.—San Francisco County.

Genus *Ceratophyllus*, Curtis.

9.—*Ceratophyllus acutus*, Baker.

1904.—Baker, Invert. Pacifica, I, p. 40.

Hosts.—*Spermophilus* sp.; California ground squirrel, *Citellus Beecheyi*; nest of wood rat, *Neotoma* sp.

Regions.—Los Angeles, Palo Alto, San Francisco Bay region.

10.—*Ceratophyllus ignotus* (Baker), Wagner.

1908.—Mitzmain, Entom. News, XIX, p. 382.

Hosts.—California pocket gopher, *Thomomys bottae*; California mole, *Scapanus Californicus*.

Region.—San Francisco Bay.

11.—*Ceratophyllus niger*, Fox.

1908.—Fox, Entom. News, XIX, p. 434.

1908.—Mitzmain, erroneously reported as *abantis*, ibid p. 382.

Hosts.—Domestic fowl, *Gallus domesticus*; nest of the sparrow, *Passer domesticus*; man; brown rat, *Mus Norvegicus*.

Region.—San Francisco Bay.

12.—*Ceratophyllus proximus*, Baker.

1904.—Proc. U. S. Nat. Mus., XXVII, pp. 412, 446.

Host.—Ground squirrel, *Citellus* sp.

Region—Southern California.

13.—*Ceratophyllus sexdentatus*, Baker.

1904.—Baker, Proc. U. S. Nat. Mus., XXVII, pp. 403, 446.

Host.—Taken from the nest and from the wood rat, *Neotoma* sp.

Regions—San Francisco County and Central California.

14.—*Ceratophyllus Californicus*, Baker.

1904.—Baker, Proc. U. S. Nat. Mus., XXVII, pp. 395, 440.

Host.—Field mouse, *Microtus Californicus*.

Region.—Central California.

15.—*Ceratophyllus ciliatus*, Baker.

1904.—Baker, Proc. U. S. Nat. Mus., XXVII, pp. 397, 441.

Host.—Chipmunk, *Eutamias* sp.

Region.—Central California.

16.—*Ceratophyllus fasciatus*, Bosc.

1907.—Mitzmain, Bull. Cal. State Board of Health, III, p. 39.

Hosts.—House mouse, *Mus musculus*; brown rat, *Mus Norvegicus*; black rat, *Mus rattus*; man; California skunk, *Mephitis occidentalis*; California pocket gopher, *Thomomys bottae*.

17.—*Ceratophyllus Londoniensis*, Roth.

1909.—Fox, Entom. News, XX, p. 11.

Host.—Black rat, *Mus rattus*.

Region.—San Francisco County.

18.—*Ceratophyllus telchinum*, Roth.

1909.—Fox, Entom. News, XX, p. 10.

Host.—Field mouse, *Microtus Californicus*.

Region.—San Francisco County.

19.—*Ceratophyllus multidentatus*, Fox.

1909.—Fox. Unpublished. To appear in early number of Entom. News.

Host.—Field mouse, *Microtus Californicus*.

Region.—San Francisco County.

20.—*Ceratophyllus*, spec. nov., Fox.

1909.—Fox. Unpublished. To appear shortly.

Host.—California weasel, *Putorius xanthogenys*.

Region.—San Francisco County.

21.—*Ceratophyllus Wagneri*, Baker.

1909.—Fox. Heretofore unrecorded.

Host.—Weasel, *Putorius xanthogenys*.

Region.—San Francisco County.

22.—*Ceratophyllus anisus*, Roth.

1909.—Fox. Reported in a private communication; has not appeared in American literature.

Host.—Brown rat, *Mus Norvegicus*.

Region.—San Francisco County.

Genus *Odontopsyllus*, Baker.

23.—*Odontopsyllus*, spec. nov., Fox.

1909.—Fox, Entom. News, XX, p. 11. Recorded as *Charlottensis*. Rothschild pronounced it a new species.

Hosts.—Field mouse, *Microtus Californicus*; nest of wood rat, *Neotoma* sp.

Region.—San Francisco County.

24.—*Odontopsyllus Wymani*, Fox.

1909.—Fox. To be published in Ent. News.

Host.—California mouse, *Microtus Californicus*.

Region.—San Francisco County.

25.—*Coryopsylla ornatus*, Fox.

1909.—Fox, Entom. News, XX, p. 11.

Host.—California mole, *Scapanus Californicus*.

Region.—San Francisco County.

Genus *Spilopsyllus*, Baker.

26.—*Spilopsyllus inæqualis*, Baker.

1909.—P. A. Surgeon Geo. W. McCoy. Hitherto unrecorded.

Host.—Bachman brush hare, *Lepus Bachmani*.

Family CTENOPSYLLIDÆ, Baker.

Genus *Ctenopsyllus*, Kolenati.

27.—*Ctenopsyllus musculi* (Duges), Wagner.

1908.—Mitzmain, Entom. News, XIX, p. 382.

Hosts.—House mouse, *Mus musculus*; black rat, *Mus rattus*; brown rat, *Mus Norvegicus*; field mouse, *Microtus Californicus*.

Region.—San Francisco Bay region.

Family HYSTRICHOPSYLLIDÆ, Baker.

Genus *Hystrichopsylla*, Taschenberg.

28.—*Hystrichopsylla dippiei*, Roth.

1909.—Fox, Entom. News, XX, p. 11. Recorded as a new species. Dr. Fox sent specimens to Mr. Rothschild, who identified them.

Hosts.—California field mouse, *Microtus Californicus*; nest of wood rat, *Neotoma* sp.

Region.—San Francisco County.

29.—*Dolicopsyllus Blaesi*, Fox.

1909.—Fox, Ent. News, XX, p. 195.

Host.—California weasel, *Putorius xanthogenys*.

Region.—San Francisco County.

## HOST INDEX.

Including Normal and Temporary or Accidental Parasites.

<i>MAN—</i>	Pulex irritans, Linn. Ctenocephalus felis, Roth. Ctenocephalus canis (Curtis), Baker. Ceratophyllus niger, Fox. Ceratophyllus fasciatus, Bosc. Argopsylla gallinacea (Westw.), End.
<i>Canis familiaris—</i>	Ctenocephalus canis (Curtis), Baker. Pulex irritans, Linn.
<i>Felis domestica—</i>	Ctenocephalus felis, Roth.
<i>Spilogale phenax—</i>	Anomiopsyllus Californicus, Baker.
<i>Mephitis occidentalis—</i>	Ctenocephalus felis, Roth. Pulex irritans, Linn. Ceratophyllus fasciatus, Bosc.
<i>Putorius xanthogenys—</i>	Ceratophyllus ignotus, Baker. Ceratophyllus spec., Fox. Ceratophyllus Wagneri, Baker.
<i>Lepus Bachmani—</i>	Hoplopsyllus affinis, Baker. Spilopsyllus inæqualis, Baker.
<i>Thomomys bottæ—</i>	Ceratophyllus ignotus (Baker), Wagner. Ceratophyllus fasciatus, Bosc.
<i>Scapanus Californicus—</i>	Corypsylla ornatus, Fox. Ceratophyllus ignotus (Baker), Wagner. Ctenopsyllus musculi (Duges), Wagner.
<i>Eutamias sp.—</i>	Ceratophyllus ciliatus, Baker.
<i>Neotoma sp.—</i>	Hystrichopsylla dippiei, Roth. Odontopsyllus sp., Fox. Ceratophyllus sexdentatus, Baker. Ceratophyllus acutus, Baker.
<i>Microtus Californicus—</i>	Ceratophyllus Californicus, Baker. Hystrichopsylla dippiei, Roth. Ctenopsyllus musculi (Duges), Wagner. Odontopsyllus spec., Fox. Ceratophyllus multidentatus, Fox. Ceratophyllus telchinum, Roth.

<i>Mus musculus</i> —	Ctenopsyllus musculi (Duges), Wagner. Loemopsylla cheopis, Roth. Ceratophyllus fasciatus, Bosc.
<i>Mus rattus</i> —	Ctenopsyllus musculi (Duges), Wagner. Loemopsylla cheopis, Roth. Ceratophyllus fasciatus, Bosc. Pulex irritans, Linn. Ctenocephalus canis (Curtis), Baker. Ceratophyllus Londoniensis, Roth.
<i>Mus Norvegicus</i> —	Ceratophyllus fasciatus, Bosc. Loemopsylla cheopis, Roth. Pulex irritans, Linn. Ctenopsyllus musculi (Duges), Wagner. Ctenocephalus canis (Curtis), Baker. Ctenocephalus felis, Roth. Ceratophyllus acutus, Baker. Ceratophyllus niger, Fox. Ceratophyllus anisus, Roth. Hoplopsyllus anomalus, Baker.
<i>Citellus Beecheyi</i> —	Ceratophyllus acutus, Baker. Hoplopsyllus anomalus, Baker.
<i>Citellus sp</i> —	Ceratophyllus proximus, Baker.
<i>Gallus domesticus</i> —	Argopsylla gallinacea (Westw.), End. Pulex irritans, Linn. Ceratophyllus niger, Fox.
<i>Passer domesticus</i> —	Ceratophyllus niger, Fox.

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#### CORRIGENDA.

Page 157, lines 11 and 5 from the bottom, and page 158, lines 2, 9, 16 and 21 from the top, for *Solidago ceasia* read *Solidago cæsia*.

Page 158, line 18 from the top, for *Pedisca ceasiella* read *Pedisca cæsiella*.

Page 159, line 12 from the bottom, for "destructive" read "descriptive."